Complete Summary

GUIDELINE TITLE

British guideline on the management of asthma. A national clinical guideline.

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN), British Thoracic Society. British guideline on the management of asthma. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2009 Jun. 125 p. (SIGN publication; no. 101). [833 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Scottish Intercollegiate Guidelines Network (SIGN), British Thoracic Society. British guideline on the management of asthma. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2008 May. 121 p. (SIGN publication; no. 101). [766 references]

This guideline will be considered for review in three years. Any amendments to the guideline in the interim period will be noted on the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- July 14, 2009 - Sirolimus (Rapamune), Cyclosporine (Sandimmune or Neoral and generics), Mycophenolate mofetil (Cellcept and generics), Mycophenolic acid (Myfortic): The U.S. Food and Drug Administration (FDA) is requiring the makers of certain immunosuppressant drugs to update their labeling to reflect that immunosuppressed patients are at increased risk for opportunistic infections, such as activation of latent viral infections, including BK virus-associated nephropathy.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Asthma

GUIDELINE CATEGORY

Counseling
Diagnosis
Evaluation
Management
Prevention
Risk Assessment
Treatment

CLINICAL SPECIALTY

Allergy and Immunology
Critical Care
Emergency Medicine
Family Practice
Internal Medicine
Obstetrics and Gynecology
Pediatrics
Pulmonary Medicine

INTENDED USERS

Advanced Practice Nurses
Nurses
Pharmacists
Physician Assistants
Physicians
Respiratory Care Practitioners

GUIDELINE OBJECTIVE(S)

- To provide comprehensive recommendations on asthma management for patients of all ages in both primary and secondary care that will be of use to all health professionals involved in the care of people with asthma
- To update the 2008 British Guideline on the Management of Asthma

TARGET POPULATION

Children, adolescents, and adults with asthma

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation

1. Detailed medical history and physical examination
2. Measurement of peak expiratory flow
3. Measurement of forced expiratory volume in one second
4. Chest x-ray
5. Allergy testing

Management/Treatment

1. Primary prophylaxis
    - Encouragement of mothers to breastfeed their infants
    - Encouragement of parents and parents-to-be to stop smoking
2. Non-pharmacological management
    - House dust mite control measures
    - Family therapy (i.e., in difficult childhood asthma, as an adjunct to pharmacological therapy)
    - Weight reduction in obese patients
    - Treatment of gastro-oesophageal reflux if present
    - Breathing exercises
3. Pharmacological management*
    - Short acting and long acting inhaled $beta_2$ agonists
    - Inhaled ipratropium bromide
    - $Beta_2$ agonists tablets or syrup
    - Theophyllines
    - Oral and inhaled steroids
    - Chromones
    - Leukotriene receptor antagonists
    - Immunosuppressants, such as methotrexate, cyclosporin, oral gold
    - Omalizumab
4. Other interventions considered
    - Intranasal steroids for the treatment of rhinitis
    - Itraconazole for the treatment of allergic bronchopulmonary aspergillosis
5. Inhaler devices
    - Pressurized metered-dose inhaler with or without spacer
    - Dry powder inhaler
    - Nebuliser
6. Acute asthma management**
    - Clinical assessment
    - Referral to hospital, when necessary

- Oxygen therapy
- Nebulised beta$_2$ agonist bronchodilator driven by oxygen or large volume spacers or nebulisers
- Intravenous beta$_2$ agonist
- Continuous nebulisation
- Steroid treatment, such as prednisolone
- Nebulised ipratropium bromide
- Intravenous magnesium sulphate
- Intravenous aminophylline
- Antibiotic therapy (not recommended routinely)
- Heliox (not recommended outside a clinical trial setting)
- Non-invasive ventilation (recommended only in intensive care unit or equivalent clinical setting)
- Follow-up

Education/Counseling

1. Training on inhaler technique
2. Training on peak flow measurement
3. Pre-pregnancy counseling
4. Self-management education, including pre-discharge education and action plans

***Note**: The type of pharmacological management varies by age group and symptoms present. See the "Major Recommendations" field and the original guideline document for specific information on the stepwise approach and the appropriate age.

****Note**: Management and treatment of acute asthma varies by age group. See the "Major Recommendations" fieldÂ and the original guideline document for specific information on which interventions are recommended for each age segment.

MAJOR OUTCOMES CONSIDERED

- Sensitivity and specificity of diagnostic tests
- Results of diagnostic tests
- Response to treatment
- Symptom control
- Decline in lung function
- Adverse and side effects of treatments
- Corticosteroid resistance
- Asthma-related morbidity and mortality

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence base for this guideline built on the reviews carried out for the original (2003) version of the guideline and subsequent updates. All searches

covered the Cochrane Library, Embase, and Medline. See Annex 1 of the original guideline documentÂ for details of theÂ time period covered for each topic.

The electronic searches extended to 1995, although some sections required literature searches to go as far back as 1966. The pharmacological management section utilised the North of England Asthma guideline to address some of the key questions on adult management. The North of England Guideline literature search covered a period from 1984 to December 1997, and the Scottish Intercollegiate Guidelines Network (SIGN) augmented this with a search from 1997 onwards.

The 2008 guideline considered literature published up to March 2007. The 2009 revisions include updates to pharmacological management, the management of acute asthma and asthma in pregnancy. Update searches were conducted on inhaler devices but there was insufficient evidence to change the existing recommendations.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus
Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

1++ - High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

1+ - Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

1- - Meta-analyses, systematic reviews, or RCTs with a high risk of bias

2++ - High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ - Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- - Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 - Non-analytic studies (e.g., case reports, case series)

4 - Expert opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Once papers have been selected as potential sources of evidence, the methodology used in each study is assessed to ensure its validity. The result of this assessment will affect the level of evidence allocated to the paper, which will in turn influence the grade of recommendation it supports.

The methodological assessment is based on a number of key questions that focus on those aspects of the study design that research has shown to have a significant influence on the validity of the results reported and conclusions drawn. These key questions differ between study types, and a range of checklists is used to bring a degree of consistency to the assessment process. Scottish Intercollegiate Guidelines Network (SIGN) has based its assessments on the MERGE (Method for Evaluating Research and Guideline Evidence) checklists developed by the New South Wales Department of Health, which have been subjected to wide consultation and evaluation. These checklists were subjected to detailed evaluation and adaptation to meet SIGN's requirements for a balance between methodological rigour and practicality of use.

The assessment process inevitably involves a degree of subjective judgment. The extent to which a study meets a particular criterion (e.g., an acceptable level of loss to follow up) and, more importantly, the likely impact of this on the reported results from the study will depend on the clinical context. To minimise any potential bias resulting from this, each study must be evaluated independently by at least two group members. Any differences in assessment should then be discussed by the full group. Where differences cannot be resolved, an independent reviewer or an experienced member of SIGN Executive staff will arbitrate to reach an agreed quality assessment.

Evidence Tables

Evidence tables are compiled by SIGN executive staff based on the quality assessments of individual studies provided by guideline development group members. The tables summarise all the validated studies identified from the systematic literature review relating to each key question. They are presented in a standard format to make it easier to compare results across studies, and will present separately the evidence for each outcome measure used in the published studies. These evidence tables form an essential part of the guideline development record and ensure that the basis of the guideline development group's recommendations is transparent.

This guideline was jointly produced by SIGN and the British Thoracic Society (BTS), using SIGN methodology, adapted for United Kingdom-wide development. The Asthma United Kingdom (UK), the Royal College of Physicians of London, the

Royal College of Paediatrics and Child Health, General Practice Airways Group, and the British Association of Accident and Emergency Medicine also collaborated in the development of this guideline.

Additional details can be found in the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50]), available from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Synthesising the Evidence

Guideline recommendations are graded to differentiate between those based on strong evidence and those based on weak evidence. This judgment is made on the basis of an (objective) assessment of the design and quality of each study and a (perhaps more subjective) judgment on the consistency, clinical relevance and external validity of the whole body of evidence. The aim is to produce a recommendation that is evidence-based, but which is relevant to the way in which health care is delivered in Scotland and is therefore implementable.

It is important to emphasise that the grading does not relate to the importance of the recommendation, but to the strength of the supporting evidence and, in particular, to the predictive power of the study designs from which that data was obtained. Thus, the grading assigned to a recommendation indicates to users the likelihood that, if that recommendation is implemented, the predicted outcome will be achieved.

Considered Judgment

It is rare for the evidence to show clearly and unambiguously what course of action should be recommended for any given question. Consequently, it is not always clear to those who were not involved in the decision making process how guideline developers were able to arrive at their recommendations, given the evidence they had to base them on. In order to address this problem, SIGN has introduced the concept of considered judgment.

Under the heading of considered judgment, guideline development groups summarise their view of the total body of evidence covered by each evidence table. This summary view is expected to cover the following aspects:

- Quantity, quality, and consistency of evidence
- Generalisability of study findings
- Directness of application to the target population for the guideline
- Clinical impact (i.e., the extent of the impact on the target patient population, and the resources needed to treat them)

- Implementability (i.e., how practical it would be for the NHS in Scotland to implement the recommendation)

Guideline development groups are provided with a pro forma in which to record the main points from their considered judgment. Once they have considered these issues, the group is asked to summarise their view of the evidence and assign a level of evidence to it, before going on to derive a graded recommendation.

Additional detail about SIGN's process for formulating guideline recommendations is provided in Section 6 of the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50], available from the SIGN Web site.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendation

Note: The grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

A: At least one meta-analysis, systematic review, or RCT rated as 1++ and directly applicable to the target population; or

A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 1++ or 1+

C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 2++

D: Evidence level 3 or 4; or

Extrapolated evidence from studies rated as 2+

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Peer Review

All SIGN guidelines are reviewed in draft form by independent expert referees, who are asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence base supporting the recommendations in the guideline. A number of general practitioners (GPs) and other primary care practitioners also provide comments on the guideline from the primary care perspective, concentrating particularly on the clarity of the recommendations and their assessment of the usefulness of the guideline as a working tool for the primary care team. The draft is also sent to a lay reviewer in order to obtain comments from the patient's perspective. The comments received from peer reviewers and others are carefully tabulated and discussed with the chairman and with the guideline development group. Each point must be addressed and any changes to the guideline as a result noted or, if no change is made, the reasons for this recorded.

As a final quality control check prior to publication, the guideline and the summary of peer reviewers' comments are reviewed by the SIGN Editorial Group for that guideline to ensure that each point has been addressed adequately and that any risk of bias in the guideline development process as a whole has been minimised. Each member of the guideline development group is then asked formally to approve the final guideline for publication.

Consultation and Specialist Review for Most Recent Changes

The most recent changes to this guideline were presented for discussion in draft form at the Winter Meeting of the British Thoracic Society (BTS) in December 2008. The draft guideline was also available on the SIGN and BTS websites for a limited period at this stage to allow those unable to attend the meeting to contribute to the development of the guideline.

The guideline was also reviewed in draft form by independent expert referees, who were asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence base supporting the recommendations in the guideline.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The grades of recommendations (A-D), levels of evidence (1++, 1+, 1-, 2++, 2+, 2-, 3, 4), and good practice points (GPPs) are defined at the end of the "Major Recommendations" field.

Diagnosis

Diagnosis in Children

Making a Diagnosis in Children

B - Focus the initial assessment in children suspected of having asthma on:

- Presence of key features in the history and examination
- Careful consideration of alternative diagnoses

GPP - Record the basis on which a diagnosis of asthma is suspected.

High Probability of Asthma

GPP - In children with a high probability of asthma:

- Start a trial of treatment
- Review and assess response
- Reserve further testing for those with a poor response

Low Probability of Asthma

GPP - In children with a low probability of asthma, consider more detailed investigation and specialist referral.

Children with an Intermediate Probability of Asthma and Evidence of Airway Obstruction

GPP - In children with an intermediate probability of asthma who can perform spirometry and have evidence of airways obstruction, assess the change in forced expiratory volume in one second (FEV_1) or peak expiratory flow (PEF) in response to an inhaled bronchodilator (reversibility) and/or the response to a trial of treatment for a specified period:

- If there is significant reversibility, or if a treatment trial is beneficial, a diagnosis of asthma is probable. Continue to treat as asthma, but aim to find the minimum effective dose of therapy. At a later point, consider a trial of reduction or withdrawal of treatment.
- If there is no significant reversibility, and a treatment trial is not beneficial, consider tests for alternative conditions (see Table 3 in the original guideline document).

Children with an Intermediate Probability of Asthma Without Evidence of Airway Obstruction

C - In children with an intermediate probability of asthma who can perform spirometry and have no evidence of airways obstruction:

- Consider testing for atopic status, bronchodilator reversibility and, if possible, bronchial hyper-responsiveness using methacholine, exercise or mannitol
- Consider specialist referral

Children with an Intermediate Probability of Asthma Who Cannot Perform Spirometry

GPP - In children with an intermediate probability of asthma who cannot perform spirometry, offer a trial of treatment for a specified period:

- If treatment is beneficial, treat as asthma and arrange a review.
- If treatment is not beneficial, stop asthma treatment and consider tests for alternative conditions and specialist referral.

Other Investigations

Chest X-Ray

GPP - Reserve chest X-rays for children with severe disease or clinical clues suggesting other conditions.

Diagnosis in Adults

GPP - Base initial diagnosis on a careful assessment of symptoms and a measure of airflow obstruction:

- In patients with a high probability of asthma move straight to a trial of treatment. Reserve further testing for those whose response to a trial of treatment is poor.
- In patients with a low probability of asthma, whose symptoms are thought to be due to an alternative diagnosis, investigate and manage accordingly. Reconsider the diagnosis of asthma in those who do not respond.
- The preferred approach in patients with an intermediate probability of having asthma is to carry out further investigations, including an explicit trial of treatments for a specified period, before confirming a diagnosis and establishing maintenance treatment.

D - Spirometry is the preferred initial test to assess the presence and severity of airflow obstruction.

Further Investigation of Patients with an Intermediate Probability of Asthma

<u>Patients With Airways Obstruction</u>

GPP - Offer patients with airways obstruction and intermediate probability of asthma a reversibility test and/or a trial of treatment for a specified period:

- If there is significant reversibility, or if a treatment trial is clearly beneficial, treat as asthma
- If there is insignificant reversibility and a treatment trial is not beneficial, consider tests for alternative conditions (see section 2.5 in the original guideline document for more detailed information on further tests).

<u>Patients Without Airways Obstruction</u>

GPP - In patients without evidence of airways obstruction and with an intermediate probability of asthma, arrange further investigations (see section 2.5 in the original guideline document for more detailed information on further tests) before commencing treatment.

GPP - Consider performing chest X-ray in any patient presenting atypically or with additional symptoms or signs. Additional investigations such as full lung function tests, blood eosinophil count, serum immunoglobulin E (IgE) and allergen skin prick tests may be of value in selected patients.

Further InvestigationÂ That May Be Useful inÂ Patients with an Intermediate Probability of Asthma

Treatment Trials and Reversibility Testing

C - Assess FEV_1 (or PEF) and/or symptoms:

- Before and after 400 micrograms inhaled salbutamol in patients with diagnostic uncertainty and airflow obstruction present at the time of assessment
- In other patients, or if there is an incomplete response to inhaled salbutamol, after either inhaled corticosteroids (200 micrograms twice daily beclometasone equivalent for 6-8 weeks) or oral prednisolone (30 mg once daily for 14 days).

Peak Expiratory Flow Monitoring

GPP - Peak flow records should be interpreted with caution and with regard to the clinical context. They are more useful in the monitoring of patients with established asthma than in making the initial diagnosis.

Tests of Eosinophilic Airway Inflammation

C - In patients in whom there is diagnostic uncertainty and no evidence of airflow obstruction on initial assessment, test airway responsiveness wherever possible.

Non-Pharmacologic Management

Primary Prophylaxis

Food Allergen Avoidance

B - In the absence of any evidence of benefit and given the potential for adverse effects, maternal food allergen avoidance during pregnancy and lactation is not recommended as a strategy for preventing childhood asthma.

Breast Feeding

C - Breast feeding should be encouraged for its many benefits, and as it may also have a potential protective effect in relation to early asthma.

Avoidance of Tobacco Smoke and Other Air Pollutants

B - Parents and parents-to-be should be advised of the many adverse effects which smoking has on their children including increased wheezing in infancy and increased risk of persistent asthma.

Immunisation

C - All childhood immunisations should proceed normally as there is no evidence of an adverse effect on the incidence of asthma.

Secondary Non-pharmacologic Prophylaxis

GPP - Families with evidence of house dust mite allergy and who wish to try mite avoidance might consider the following:

- Complete barrier bed-covering systems
- Removal of carpets
- Removal of soft toys from bed
- High temperature washing of bed linen
- Acaricides to soft furnishings
- Good ventilation with or without dehumidification

Other Environmental Factors

Smoking

C - Parents with asthma should be advised about the dangers of smoking to themselves and their children with asthma and offered appropriate support to stop smoking.

Immunotherapy

Subcutaneous Immunotherapy

B - Immunotherapy can be considered in patients with asthma where a clinically significant allergen cannot be avoided. The potential for severe allergic reactions to the therapy must be fully discussed with patients.

Sublingual Immunotherapy

B - Sublingual immunotherapy cannot currently be recommended for the treatment of asthma in routine practice.

Dietary Manipulation

Weight Reduction in Obese Patients with Asthma

C - Weight reduction is recommended in obese patients with asthma to promote general health and to improve asthma control.

Immunisations

B - Immunisations should be administered independent of any considerations related to asthma. Responses to vaccines may be attenuated by high-dose inhaled steroids.

Air Ionisers

A - Air ionisers are not recommended for the treatment of asthma.

Breathing Exercises including Yoga and the Buteyko Breathing Technique

B - Buteyko breathing technique may be considered to help patients to control the symptoms of asthma.

Family Therapy

GPP - In difficult childhood asthma, there may be a role for family therapy as an adjunct to pharmacotherapy.

Pharmacological Management

GPP - Lung function measurements cannot be reliably used to guide asthma management in children underÂ five years of age.

GPP - Before initiating a new drug therapy practitioners should check compliance with existing therapies (see section 9.2 in the original guideline document), inhaler technique (see section 5 in the original guideline document) and eliminate trigger factors (see section 3 in the original guideline document).

Until May 2009 all doses of inhaled steroids in this section have been referenced against beclometasone (BDP) given via chlorofluorocarbon-propelled (CFC)-MDIs (metered dose inhalers). As BDP CFC is phased out, the reference inhaled steroid will be the BDP-hydrofluoroalkane-propelled (HFA) equivalent, which can be used at the same dosage. Adjustments to doses will have to be made for other devices and other corticosteroid molecules (see section 4.2 in the original guideline document and the table below).

In this and the following section ("Inhaler Devices"), each recommendation has been graded for adults (>12 years old), children 5 to 12 years, and children under 5 years. The evidence is less clear in children under two and the threshold for seeking an expert opinion should be lowest in these children. See Figures 4, 5, and 6 in the original guideline document for a summary of stepwise management in each of the age ranges. The evidence is less clear in children under two and the threshold for seeking an expert opinion should be lowest in these children.

Step 1: Mild Intermittent Asthma

A (adults); B (children aged 5 to 12 years); C (children under 5 years) - Prescribe an inhaled short-acting $beta_2$ agonist as short-term reliever therapy for all patients with symptomatic asthma.

Frequency of Dosing of Inhaled Short-Acting Beta$_2$ Agonists

GPP - Patients with high usage of inhaled short-acting beta$_2$ agonists should have their asthma management reviewed.

Step 2: Introduction of Regular Preventer Therapy

Comparison of Inhaled Steroids

Table. Equivalent Doses of Inhaled Steroids Relative to BDP and Current Licensed Age Indications

These dosage equivalents are approximate and will depend on other factors such as inhaler technique.

Â	Â	**UK Licence Covers**		
Steroid	**Equivalent Dose**	**>12 Years**	**5 to 12**	**<5 Years**
Beclometasone dipropionate CFC	400 mcg	**No longer available**		
Beclometasone				
Clenil modulite	400 mcg	Yes	Yes	Yes
Clickhaler		Yes	Over age 6	No
Aerobec Autohaler		Yes	No	No
Asmabec Clickhaler		Yes	Over age 6	No
Dry powder (Becodisks)		Yes	Yes	Yes
Easyhaler		Yes	No	No
Pulvinal		Yes	Over age 6	No
Filair		Yes	Yes	Yes
Qvar	200 to 300 mcg	Yes	No	No
Fostair	200 mcg	Over age 18	No	No
Budesonide				
Turbohaler	400 mcg	Yes	Yes	No

Â	Â	UK Licence Covers		
Steroid	**Equivalent Dose**	**>12 Years**	**5 to 12**	**<5 Years**
Metered dose inhaler		Yes	Yes	Over age 2
Easyhaler		Yes	Over age 6	No
Novolizer		Yes	Over age 6	No
Symbicort		Yes	Over age 6	No
Symbicort (regular and as required dosing)		Over age 18	No	No
Fluticasone				
Metered dose inhaler (HFA)	200 mcg	Yes	Yes	Over age 4
Accuhaler		Yes	Yes	Over age 4
Seretide HFA		Yes	Yes	Over age 4
Seretide (Accuhaler)		Yes	Yes	Over age 4
Mometasone	200 mcg	Yes	No	No
Ciclesonide	200 to 300 mcg	Yes	No	No

Inhaled Steroids

A (adults); A (children aged 5 to 12 years); A (children under 5 years) - Inhaled steroids are the recommended preventer drug for adults and children for achieving overall treatment goals.

Inhaled steroids should be considered for patients with any of the following asthma related features:

B (adults); C (children aged 5 to 12 years) - Exacerbations of asthma in the last two years

B (adults); B (children aged 5 to 12 years); B (children under 5 years) - Using inhaled $beta_2$ agonists three times a week or more

B (adults); B (children aged 5 to 12 years); B (children under 5 years) - Symptomatic three times a week or more

B (adults); B (children aged 5 to 12 years); GPP (children under 5 years) - Waking one night a week

Starting Dose of Inhaled Steroids

GPP - Start patients at a dose of inhaled steroids appropriate to the severity of disease.

GPP - In adults, a reasonable starting dose will usually be 400 micrograms BDP per day and in children 200 micrograms BDP per day. In children under five years, higher doses may be required if there are problems in obtaining consistent drug delivery.

GPP - Titrate the dose of inhaled steroid to the lowest dose at which effective control of asthma is maintained.

Frequency of Dosing of Inhaled Steroids

A (adults); D (children aged 5 to 12 years); D (children under 5 years) - Give inhaled steroids initially twice daily, except ciclesonide which is given once daily.

A (adults); D (children aged 5 to 12 years); D (children under 5 years) - Once a day inhaled steroids at the same total daily dose can be considered if good control is established.

Safety of Inhaled Steroids

Adults

GPP - Titrate the dose of inhaled steroid to the lowest dose at which effective control of asthma is maintained.

Children

GPP - Monitor height of children on high doses of inhaled steroids on a regular basis.

GPP - The lowest dose of inhaled steroids compatible with maintaining disease control should be used.

For children treated with $\geq$800 micrograms per day of beclomethasone dipropionate (BDP) or equivalent:

GPP - Specific written advice about steroid replacement in the event of a severe intercurrent illness should be part of the management plan.

GPP - The child should be under the care of a specialist paediatrician for duration of the treatment.

Smoking

B (adults) - Clinicians should be aware that higher doses of inhaled steroids may be needed in patients who are smokers/ex-smokers.

Other Preventer Therapies

GPP - In children under five years who are unable to take inhaled corticosteroids, leukotriene receptor antagonists are an effective first line preventor.

Step 3: Initial Add-on Therapy

Add-On Therapy

A (adults); B (children aged 5 to 12 years) - The first choice as add-on therapy to inhaled steroids in adults and children (5-12 years) is an inhaled long-acting beta$_2$ agonist, which should be considered before going above a dose of 400 micrograms BDP or equivalent per day and certainly before going above 800 micrograms BDP.

B (children under 5 years) - The first choice as add-on therapy to inhaled steroids in children under five years old is leukotriene receptor antagonists.

D (adults); D (children aged 5 to 12 years) - If asthma control remains suboptimal after the addition of an inhaled long-acting beta$_2$ agonist, then the dose of inhaled steroids should be increased to 800 micrograms/day in adults or 400 micrograms/day in children (5 to 12 years, if not already on these doses.

GPP - If control remains inadequate after stopping a long-acting inhaled beta$_2$ agonist (LABA) and increasing the dose of inhaled steroid, consider sequential trials of add-on therapy (i.e., leukotriene receptor antagonists, theophyllines, slow-release beta$_2$ agonist tablets [this in adults only]).

GPP - Long-acting inhaled beta$_2$ agonists should only be started in patients who are already on inhaled corticosteroids.

Step 4: Poor Control on Moderate Dose of Inhaled Steroid + Add-on Therapy: Addition of Fourth Drug

D (adults); D (children aged 5 to 12 years) - If control remains inadequate on 800 micrograms BDP daily (adults) and 400 micrograms daily (children) of an inhaled steroid plus a long acting beta$_2$ agonist, consider the following interventions:

- Increasing inhaled steroids to 2000 micrograms BDP/day (adults) or 800 micrograms BDP/day (children 5-12 years)*
- Leukotriene receptor antagonists
- Theophyllines
- Slow release beta$_2$ agonist tablets, though caution needs to be used in patients on long acting beta$_2$ agonists

* At high doses of inhaled steroid via metered-dose inhaler (MDI), a spacer should be used.

GPP - If a trial of an add-on treatment is ineffective, stop the drug (or in the case of increased dose of inhaled steroid, reduce to the original dose).

GPP - Before proceeding to step 5, refer patients with inadequately controlled asthma, especially children, to specialist care.

Step 5: Continuous or Frequent Use of Oral Steroids

GPP - For the small number of patients not controlled at step 4, use daily steroid tablets in the lowest dose providing adequate control.

Steroid Tablet-Sparing Medication

A (adults); D (children aged 5 to 12 years) - In adults the recommended method of eliminating or reducing the dose of steroid tablets is inhaled steroids, at doses of up to 2,000 micrograms/day if required. In children aged 5 to 12, consider very carefully before going above a dose of 800 micrograms/day.

D (adults); D (children aged 5 to 12 years); D (children under 5 years) - There is a role for a trial of treatment with long acting beta$_2$ agonists, leukotriene receptor antagonists, and theophyllines for about six weeks. They should be stopped if no improvement in steroid dose, symptoms, or lung function is detected.

GPP - Immunosuppressants (methotrexate, ciclosporin and oral gold) may be given as a three month trial, once other drug treatments have proved unsuccessful. Their risks and benefits should be discussed with the patient and their treatment effects carefully monitored. Treatment should be in a centre with experience of using these medicines.

Anti-IgE Monoclonal Antibody

GPP - Omalizumab treatment should only be initiated in specialist centres with experience of evaluation and management of patients with severe and difficult asthma.

Stepping Down

GPP - Regular review of patients as treatment is stepped down is important. When deciding which drug to step down first and at what rate, the severity of asthma, the side-effects of the treatment, time on current dose, the beneficial effect achieved, and the patient's preference should all be taken into account.

GPP - Patients should be maintained at the lowest possible dose of inhaled steroid. Reduction in inhaled steroid dose should be slow as patients deteriorate at different rates. Reductions should be considered every three months, decreasing the dose by approximately 25% to 50% each time.

Specific Management Issues

Exercise Induced Asthma

GPP - For most patients, exercise-induced asthma is an expression of poorly controlled asthma and regular treatment including inhaled steroids should be reviewed.

If exercise is a specific problem in patients taking inhaled steroids who are otherwise well controlled, consider the following therapies:

A (adults); C (children aged 5 to 12 years) - Leukotriene receptor antagonists

A (adults); A (children aged 5 to 12 years) - Long acting beta$_2$ agonists

C (adults);Â C (children aged 5 to 12 years) - Chromones

A (adults);Â A (children aged 5 to 12 years) - Oral beta$_2$ agonists

C (adults);Â C (children aged 5 to 12 years) - Theophyllines

A (adults);Â A (children aged 5 to 12 years) - Immediately prior to exercise, inhaled short-acting beta$_2$ agonists are the drug of choice.

Allergic Bronchopulmonary Aspergillosis

C (adults) - In adult patients with allergic bronchopulmonary aspergillosis (ABPA), a four month trial of itraconazole should be considered.

GPP - Careful monitoring for side-effects, particularly hepatic, is recommended.

Inhaler Devices

Technique and Training

B (adults); GPP (children aged 5 to 12 years); GPP (children under 5 years) - Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique.

Beta$_2$ Agonist Delivery

Acute Asthma

A (adults); A (children aged 5 to 12 years); B (children under 5 years) - Children and adults with mild and moderate exacerbations of asthma should be

treated by pressurized metered dose inhaler (pMDI) + spacer with doses titrated according to clinical response.

Stable Asthma

A (children aged 5 to 12 years) - In children aged 5 to 12, pMDI + spacer is as effective as any other hand held inhaler.

AÂ (adults) - In adults, pMDI ± spacer is as effective as any other hand held inhaler, but patients may prefer some types of dry powder inhaler (DPI).

GPP - Choice of reliever inhaler for stable asthma should be based on patient preference and assessment of correct use. Many patients will not be prepared to carry a spacer.

Inhaled Steroids for Stable Asthma

A (children aged 5 to 12 years) - In children aged 5 to 12 years, pMDI + spacer is as effective as any DPI.

A (adults) - In adults, a pMDI ± spacer is as effective as any DPI.

Chlorofluorocarbon (CFC) Propellant pMDI Versus Hydrofluoroalkane (HFA) Propellant pMDI

A (adults) - Salbutamol HFA can be substituted for salbutamol CFC at 1:1 dosing.

A (adults) - HFA beclomethasone dipropionate (BDP) pMDI (Qvar) may be substituted for CFC BDP pMDI at 1:2 dosing. This ratio does not apply to reformulated HFA BDP pMDIs.

A (adults) - Fluticasone HFA can be substituted for fluticasone CFC at 1:1 dosing.

Prescribing Devices

GPP - The choice of device may be determined by the choice of drug.

GPP - If the patient is unable to use a device satisfactorily an alternative should be found.

GPP - The patient should have their ability to use an inhaler device assessed by a competent health care professional (see section 5.1 in the original guideline document).

GPP - The medication needs to be titrated against clinical response to ensure optimum efficacy.

GPP - Reassess inhaler technique as part of structured clinical review.

GPP - In children aged 0 to 5 years, pMDI and spacer are the preferred method of delivery of $beta_2$ agonists or inhaled steroids. A face mask is required until the child can breathe reproducibly using the spacer mouthpiece. Where this is ineffective a nebuliser may be required.

Use and Care of Spacers

GPP - The spacer should be compatible with the pMDI being used.

GPP - The drug should be administered by repeated single actuations of the metered dose inhaler into the spacer, each followed by inhalation.

GPP - There should be minimal delay between pMDI actuation and inhalation.

GPP - Tidal breathing is as effective as single breaths.

GPP - Spacers should be cleaned monthly rather than weekly as per manufacturer's recommendations or performance is adversely affected. They should be washed in detergent and allowed to dry in air. The mouthpiece should be wiped clean of detergent before use.

GPP - Drug delivery may vary significantly due to static charge. Metal and other antistatic spacers are not affected in this way.

GPP - Plastic spacers should be replaced at least every 12 months but some may need changing at six months.

Management of Acute Asthma

Lessons from Studies of Asthma Deaths and Near-Fatal Asthma

B - Health care professionals must be aware that patients with severe asthma and one or more adverse psychosocial factors are at risk of death.

GPP - Keep patients who have had near fatal asthma or brittle asthma under specialist supervision indefinitely.

GPP - A respiratory specialist should follow up patients admitted with severe asthma for at least one year after the admission.

Acute Asthma in Adults

Criteria for Referral

D - Refer to hospital any patients with features of acute severe or life threatening asthma.

Criteria for Admission

B - Admit patients with any feature of a life threatening or near fatal attack. ("Accuracy of death certificates," 1984; Bucknall et al., 1999; Burr et al., 1999; Mohan et al., 1996; Wareham et al., 1993; Campbell et al., 1997; Innes et al., 1998)

B - Admit patients with any feature of a severe attack persisting after initial treatment. ("Accuracy of death certificates," 1984; Bucknall et al., 1999; Burr et al., 1999; Mohan et al., 1996; Wareham et al., 1993; Campbell et al., 1997; Innes et al., 1998)

C - Patients whose peak flow is greater than 75% best or predicted one hour after initial treatment may be discharged from Emergency Department (ED) unless they meet any of the following criteria, when admission may be appropriate:

- Still have significant symptoms
- Concerns about compliance
- Living alone/socially isolated
- Psychological problems
- Physical disability or learning difficulties
- Previous near fatal or brittle asthma
- Exacerbation despite adequate dose steroid tablets pre-presentation
- Presentation at night
- Pregnancy

Treatment of Acute Asthma in Adults

Oxygen

C - Give supplementary oxygen to all hypoxaemic patients with acute severe asthma to maintain an SpO_2 level of 94-98%. Lack of pulse oximetry should not prevent the use of oxygen.

A - In hospital, ambulance and primary care, nebulised $beta_2$ agonist bronchodilators should preferably be driven by oxygen.

$Beta_2$ Agonist Bronchodilators

A - Use high-dose inhaled $beta_2$ agonists as first line agents in acute asthma and administer as early as possible. Reserve intravenous $beta_2$ agonists for those patients in whom inhaled therapy cannot be used reliably.

GPP - In acute asthma with life threatening features the nebulised route (oxygen-driven) is recommended.

A - In severe asthma that is poorly responsive to an initial bolus dose of $beta_2$ agonist, consider continuous nebulisation with an appropriate nebuliser.

Steroid Therapy

A - Give steroids in adequate doses in all cases of acute asthma.

GPP - Continue prednisolone 40 to 50 mg daily for at least five days or until recovery.

Ipratropium Bromide

B - Add nebulised ipratropium bromide (0.5 mg 4 to 6 hourly) to $beta_2$ agonist treatment for patients with acute severe or life threatening asthma or those with a poor initial response to $beta_2$ agonist therapy.

Magnesium Sulphate

B - Consider giving a single dose of intravenous (IV) magnesium sulphate for patients with:

- Acute severe asthma who have not had a good initial response to inhaled bronchodilator therapy
- Life threatening or near fatal asthma

GPP - IV magnesium sulphate (1.2 to 2 g IV infusion over 20 minutes) should only be used following consultation with senior medical staff.

Intravenous Aminophylline

GPP - Use IV aminophylline only after consultation with senior medical staff.

Antibiotics

B - Routine prescription of antibiotics is not indicated for acute asthma.

Heliox

B - Heliox is not recommended for use in acute asthma outside a clinical trial setting.

Referral to Intensive Care

C - All patients transferred to intensive care units should be accompanied by a doctor suitably equipped and skilled to intubate if necessary.

Non invasive ventilation (NIV)

GPP - NIV should only be considered in an ICU or equivalent clinical setting.

Further Investigation and Monitoring

GPP - Measure and record PEF 15 to 30 minutes after starting treatment, and thereafter according to the response. Measure and record PEF before and after nebulised or inhaled $beta_2$ agonist bronchodilator (at least four times daily) throughout the hospital stay and until controlled after discharge.

GPP - Record oxygen saturation by oximetry and maintain arterial saturation of peripheral oxygen (SpO_2) at 94-98%.

GPP - Repeat measurements of blood gas tensions within one hour of starting treatment if:

- The initial partial pressure of oxygen in arterial blood (PaO_2) is <8 kPa unless SpO_2 is >92%
- The initial partial pressure of carbon dioxide in arterial blood ($PaCO_2$) is normal or raised
- The patient's condition deteriorates

GPP - Measure them again if the patient's condition has not improved by 4 to 6 hours.

GPP - Measure and record the heart rate.

GPP - Measure serum potassium and blood glucose concentrations.

GPP - Measure the serum theophylline concentration if aminophylline is continued for more than 24 hours (aim at a concentration of 10-20 mg/L orÂ 55 to 110 micromol/L).

Follow Up

GPP - It is essential that the patient's primary care practice is informed within 24 hours of discharge from the emergency department or hospital following an asthma exacerbation. Ideally this communication should be directly with a named individual responsible for asthma care within the practice, by means of fax or e-mail.

Acute Asthma in Children Aged Over 2 Years

Clinical Assessment

GPP - Decisions about admission should be made by trained clinicians after repeated assessment of the response to bronchodilator treatment.

Pulse Oximetry

B - Consider intensive inpatient treatment for children with SpO_2 <92% in air after initial bronchodilator treatment.

Chest X-Ray

GPP - A chest X-ray should be performed if there is subcutaneous emphysema, persisting unilateral signs suggesting pneumothorax, lobar collapse or consolidation and/or life threatening asthma not responding to treatment.

Initial Treatment of Acute Asthma in Children Aged Over 2 Years

GPP - Beta$_2$ agonists should be given as first line treatment. Increase beta$_2$ agonists dose by two puffs every two minutes according to response up to ten puffs.

GPP - Children with acute asthma at home and symptoms not controlled by up to 10 puffs of salbutamol via pMDI and spacer, or 2.5-5 mg of nebulised salbutamol, should seek urgent medical attention. Additional doses of bronchodilator should be given as needed whilst awaiting medical attention if symptoms are severe.

GPP - Paramedics attending to children with acute asthma should administer nebulised salbutamol driven by oxygen if symptoms are severe whilst transferring the child to the emergency department.

GPP - Children with severe or life threatening asthma should be transferred to hospital urgently.

D - The use of structured care protocols detailing bronchodilator usage, clinical assessment, and specific criteria for safe discharge is recommended.

Oxygen

GPP - Children with life threatening asthma or SpO_2 <94% should receive high flow oxygen via a tight fitting face mask or nasal cannula at sufficient flow rates to achieve normal saturations.

Inhaled Beta$_2$ Agonist Bronchodilators

A - Inhaled beta$_2$ agonists are the first line treatment for acute asthma. (Schuh et al., 1989; Schuh et al., 1990; Robertson et al., 1985; Schuh et al., 1999)

A - pMDI + spacer is the preferred option in mild to moderate asthma.

B - Individualise drug dosing according to severity and adjust according to the patient's response.

GPP - Discontinue long-acting beta$_2$ agonists when short-acting beta2 agonists are required more often than four-hourly.

Ipratropium Bromide

A - If symptoms are refractory to initial beta$_2$ agonists treatment, add ipratropium bromide (250 micrograms/dose mixed with the nebulised beta$_2$ agonists solution).

GPP - Repeated doses of ipratropium bromide should be given early to treat children who are poorly responsive to beta$_2$ agonists.

Steroid Therapy

<u>Steroid Tablets</u>

A - Give prednisolone early in the treatment of acute asthma attacks.

GPP - Use a dose of 20 mg prednisolone for children aged 2 to 5 years and a dose of 30 to 40 mg for children >5 years. Those already receiving maintenance steroid tablets should receive 2 mg/kg prednisolone up to a maximum dose of 60 mg.

GPP - Repeat the dose of prednisolone in children who vomit and consider intravenous steroids in those who are unable to retain orally ingested medication.

GPP - Treatment for up to three days is usually sufficient, but the length of course should be tailored to the number of days necessary to bring about recovery. Weaning is unnecessary unless the course of steroids exceeds 14 days. (Hatton et al., 1995; O'Driscoll et al., 1993)

Inhaled Steroids

GPP - Do not initiate inhaled steroids in preference to steroid tablets to treat acute childhood asthma.

Second Line Treatment of Acute Asthma in Children Aged Over 2 Years

IV Salbutamol

B - Consider early addition of a single bolus dose of intravenous salbutamol (15 micrograms/kg over 10 minutes) in severe cases where the patient has not responded to initial inhaled therapy.

GPP - When inserting an IV cannula take a blood sample to measure serum electrolytes. Serum potassium levels are often low after multiple doses of $beta_2$ agonists and should be replaced.

IV Aminophylline

A - Aminophylline is not recommended in children with mild to moderate acute asthma.

C - Consider aminophylline in a high dependency unit (HDU) or pediatric intensive care unit (PICU) setting for children with severe or life threatening bronchospasm unresponsive to maximal doses of bronchodilators plus steroids.

Other Therapies

GPP - Do not give antibiotics routinely in the management of children with acute asthma.

Treatment of Acute Asthma in Children Aged Less Than 2 Years

$Beta_2$ Agonist Bronchodilators

A - For mild to moderate acute asthma, a pMDI + spacer is the optimal drug delivery device.

B - Oral beta$_2$ agonists are not recommended for acute asthma in infants.

Steroid Therapy

B - Consider steroid tablets in infants early in the management of moderate to severe episodes of acute asthma in the hospital setting.

GPP - Steroid tablet therapy (10 mg of soluble prednisolone for up to three days) is the preferred steroid preparation for use in this age group.

Ipratropium Bromide

B - Consider inhaled ipratropium bromide in combination with an inhaled beta$_2$ agonist for more severe symptoms.

Special Situations

Difficult Asthma

D - Patients with difficult asthma should be systematically evaluated, including:

- Confirmation of the diagnosis of asthmaÂ
- Identification of the mechanism of persisting symptoms and assessment of adherence with therapy

D - This assessment should be facilitated through a dedicated multidisciplinary difficult asthma service, by a team experienced in the assessment and management of difficult asthma.

Factors Contributing to Difficult Asthma

Poor Adherence

C - Poor adherence with maintenance therapy should be considered as a possible mechanism in difficult asthma.

Psychosocial Factors

C - Healthcare professionals should be aware that difficult asthma is commonly associated with coexistent psychological morbidity.

D - Assessment of coexistent psychological morbidity should be performed as part of a difficult asthma assessment. In children this may include a psychosocial assessment of the family.

Dysfunctional Breathing

D - Dysfunctional breathing should be considered as part of a difficult asthma assessment.

Allergy

C - In patients with difficult asthma and recurrent hospital admission, allergen testing to moulds should be performed.

Monitoring Airway Response

B - In patients with difficult asthma, consider monitoring induced sputum eosinophil counts to guide steroid treatment.

Asthma in Pregnancy

Effects of Asthma on Pregnancy

C - Monitor pregnant women with moderate/severe asthma closely to keep their asthma well controlled.

B - Women should be advised of the importance of maintaining good control of their asthma during pregnancy to avoid problems for both mother and baby.

GPP - Advise women who smoke about the dangers for themselves and their babies and give appropriate support to stop smoking.

Management of Acute Asthma in Pregnancy

C - Give drug therapy for acute asthma as for the non-pregnant patient including systemic steroids and magnesium sulphate.

D - Deliver high flow oxygen immediately to maintain saturation above 94% to 98%.

D - Acute severe asthma in pregnancy is an emergency and should be treated vigorously in hospital.

GPP - Continuous fetal monitoring is recommended for severe acute asthma.

GPP - For women with poorly controlled asthma during pregnancy there should be close liaison between the respiratory physician and obstetrician, with early referral to critical care physicians for women with acute severe asthma.

Drug Therapy in Pregnancy

B - Counsel women with asthma regarding the importance and safety of continuing their asthma medications during pregnancy to ensure good asthma control.

$Beta_2$ Agonists

B - Use short acting beta$_2$ agonists as normal during pregnancy.

C - Use long acting beta$_2$ agonists Â (LABA) as normal during pregnancy.

Inhaled Steroids

B - Use inhaled steroids as normal during pregnancy.

Theophyllines

C - Use oral and intravenous theophyllines as normal during pregnancy.

D - Check blood levels of theophylline in acute severe asthma and in those critically dependent on therapeutic theophylline levels.

Steroid Tablets

C - Use steroid tablets as normal when indicated during pregnancy for severe asthma. Steroid tablets should never be withheld because of pregnancy. Women should be advised that the benefits of treatment with oral steroids outweigh the risks.

Leukotriene Receptor Antagonists

D - Leukotriene antagonists may be continued in women who have demonstrated significant improvement in asthma control with these agents prior to pregnancy not achievable with other medications.

Chromones

C - Use chromones as normal during pregnancy.

Management During Labour

GPP - Advise women that acute asthma is rare in labour.

GPP - Advise women to continue their usual asthma medications in labour.

GPP - In the absence of acute severe asthma, reserve caesarean section for the usual obstetric indications.

C - If anaesthesia is required, regional blockade is preferable to general anaesthesia in women with asthma.

GPP - Women receiving steroid tablets at a dose exceeding prednisolone 7.5 mg per day for more than two weeks prior to delivery should receive parenteral hydrocortisone 100 mg 6-8 hourly during labour.

D - Use prostaglandin F2-alpha with extreme caution in women with asthma because of the risk of inducing bronchoconstriction.

Drug Therapy in Breastfeeding Mothers

C - Encourage women with asthma to breastfeed.

C - Use asthma medications as normal during lactation, in line with manufacturer's recommendations.

Occupational Asthma

Incidence

B - In patients with adult onset asthma, or reappearance of childhood asthma, clinicians should be suspicious that there may be an occupational cause.

Diagnosis

GPP - Adults with airflow obstruction should be asked:

- *Are you better on days away from work?*
- *Are you better on holiday?*

Those with positive answers should be investigated for occupational asthma.

D - In suspected work-related asthma, the diagnosis of asthma should be confirmed using standard objective criteria.

Sensitivity and Specificity of Serial Peak Flow Measurements

D - Objective diagnosis of occupational asthma should be made using serial peak flow measurements, with at least four readings per day.

Specific Bronchial Provocation Testing

D - A negative specific bronchial challenge in a worker with otherwise good evidence of occupational asthma is not sufficient to exclude the diagnosis.

Management of Occupational Asthma

D - Relocation away from exposure should occur as soon as diagnosis is confirmed, and ideally within 12 months of the first work-related symptoms of asthma.

Organisation and Delivery of Care, and Audit

Routine Primary Care

Access to Routine Primary Care

A - All people with asthma should have access to primary care services delivered by doctors and nurses with appropriate training in asthma management.

Structured Review

A - In primary care, people with asthma should be reviewed regularly by a nurse or doctor with appropriate training in asthma management. Review should incorporate a written action plan.

B - Consider carrying out routine reviews by telephone for people with asthma.

C - General practices should maintain a register of people with asthma.

C - Clinical review should be structured and utilise a standard recording system.

B - Feedback of audit data to clinicians should link guideline recommendations to management of individual patients.

Patient Subgroups

D - Health professionals who provide asthma care should have heightened awareness of the complex needs of ethnic minorities, socially disadvantaged groups, adolescents, the elderly and those with communication difficulties.

Acute Exacerbations

C - Manage hospital inpatients with asthma in specialist rather than general units.

GPP - All services involved in the care of acute asthma should be staffed by appropriately trained personnel and have access to all the equipment needed to manage acute asthma.

B - Clinicians in primary and secondary care should treat asthma according to recommended guidelines.

A - Discharge from hospital or the emergency department should be a planned, supervised event which includes self management planning. It may safely take place as soon as clinical improvement is apparent.

A - All people attending hospital with acute exacerbations of asthma should be reviewed by a clinician with particular expertise in asthma management, preferably within 30 days.

See original guideline document for types of audit in asthma care and a summary of recommended audits.

Patient Education and Self-Management

Self-Management Education and Personalized Asthma Action Plans

A - Patients with asthma should be offered self-management education that focuses on individual needs, and be reinforced by a written personalised action plan.

A - Prior to discharge, in-patients should receive written personalised action plans, given by clinicians with expertise in asthma management.

Components of a Self Management Programme

A - Introduce personalised asthma action plans as part of a structured educational discussion.

Compliance and Concordance

Compliance with Monitoring and Treatment

GPP - Computer repeat-prescribing systems provide a useful index of compliance.

GPP - Where the patient agrees with the health professional that the action is appropriate compliance is more likely.

Interventions to Improve Compliance and Concordance

GPP - Provide simple, verbal and written instructions and information on drug treatment for patients and carers.

Implementation in Practice

B - Initiatives which encourage regular, structured review explicitly incorporating self management education should be used to increase ownership of personalised action plans.

Practical Advice

GPP - A hospital admission represents a window of opportunity to review self-management skills. No patient should leave hospital without a written personalised action plan and the benefit may be greatest at first admission.

GPP - An acute consultation offers the opportunity to determine what action the patient has already taken to deal with the exacerbation. Their self-management strategy may be reinforced or refined and the need for consolidation at a routine follow up considered.

GPP - A consultation for an upper respiratory tract infection or other known trigger is an opportunity to rehearse with the patient their self-management in the event of their asthma deteriorating.

GPP - Brief simple education linked to patient goals is most likely to be acceptable to patients.

Definitions:

Grades of Recommendation

Note: The grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

Grade A: At least one meta-analysis, systematic review or randomised controlled trial (RCT) rated as 1++, and directly applicable to the target population; or

A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

Grade B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 1++ or 1+

Grade C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 2++

Grade D: Evidence level 3 or 4; or

Extrapolated evidence from studies rated as 2+

Good Practice Points (GPPs): Recommended best practice based on the clinical experience of the guideline development group.

Levels of Evidence

1++ - High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

1+ - Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

1- - Meta-analyses, systematic reviews, or RCTs with a high risk of bias

2++ - High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ - Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- - Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 - Non-analytic studies (e.g., case reports, case series)

4 - Expert opinion

CLINICAL ALGORITHM(S)

Algorithms are provided in the original guideline document for:

- Presentation with suspected asthma in children (Figure 1)
- Presentation with suspected asthma in adults (Figure 2)
- Summary of step 3: add-on therapy (Figure 3)
- Summary of stepwise management in adults (Figure 4)
- Summary of stepwise management in children 5–12 years (Figure 5)
- Summary of stepwise management in children less than 5 years (Figure 6)
- Management of acute severe asthma in adults in general practice (Annex 2)
- Management of severe acute asthma in adults in Emergency Department (Annex3)
- Management of acute severe asthma in adults in hospital (Annex 4)
- Management of acute asthma in children in general practice (age 2 to 5 years) (Annex 5)
- Management of acute asthma in children in general practice (age > 5 years) (Annex 5)
- Management of acute asthma in children in Emergency Department (age 2 to 5 years) (Annex 6)
- Management of acute asthma in children in Emergency Department (age > 5 years) (Annex 6)
- Management of acute asthma in children in hospital (age 2 to 5 years) (Annex 7)
- Management of acute asthma in children in hospital (age > 5 years) (Annex 7)
- Management of acute asthma in infants aged <2 in hospital (Annex 8)
- Work-related asthma and rhinitis: case finding and management in primary care (Annex 9)

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Control of symptoms, including nocturnal symptoms and exercise-induced asthma
- Prevention of exacerbations
- Achievement of best possible pulmonary function with minimal side effects

POTENTIAL HARMS

There may be side effects associated with the use of certain asthma medications. Refer to the original guideline document for details.

CONTRAINDICATIONS

CONTRAINDICATIONS

Beta-blockers, including eye drops, are contraindicated in patients with asthma.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is advised, however, that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Implementation of national clinical guidelines is the responsibility of each National Health Service (NHS) Board and is an essential part of clinical governance. It is acknowledged that every board cannot implement every guideline immediately on publication, but mechanisms should be in place to ensure that the care provided is reviewed against the guideline recommendations and the reasons for any differences assessed and, where appropriate, addressed. These discussions should involve both clinical staff and management. Local arrangements may then be made to implement the national guideline in individual hospitals, units and practices, and to monitor compliance. This may be done by a variety of means including patient-specific reminders, continuing education and training, and clinical audit.

Successful interventions have been delivered by trained asthma healthcare professionals, in the UK usually doctors and nurses, though a quality improvement programme which trained professionals in asthma self management showed no impact on clinical outcomes.

Three primary care studies explicitly link the provision of self management education with the facilitation of regular, structured review, consistent with the concept of 'guided self management'. All three increased ownership of personalised action plans and one showed a reduction in episodes of 'speech limiting wheeze'.

Initiatives which encourage regular, structured review explicitly incorporating self management education should be used to increase ownership of personalised action plans.

Audit

Audit is a moderately effective way to improve the process and probably outcome of care. Its impact is increased if combined with other strategies to change clinician behaviour, for example outreach education programmes. Whilst trials of audit in asthma care are few, those showing benefits have tended to incorporate feedback data to clinicians on the process of care such as frequency of review, checking of inhaler technique or lung function measurement. Passive feedback of aggregated data, for instance on prescribing patterns, does not change practice.

Types of Audit in Asthma Care

National or regional audits of asthma deaths have focused attention on delivery of care for severe asthma. Some primary care trusts (PCT) have PCT-wide programmes of audit which extract practice data electronically and feedback comparative data on process of care, promoting a benchmarking approach to quality improvement. The General Medical Services Quality and Outcomes Framework (QOF) links audit of asthma care to financial incentives. Critical event audit focuses on an adverse event such as an asthma death, or failure of delivery care. How effective these activities are in improving outcomes of asthma care is uncertain.

Common sense suggests that auditing activities shown to improve patient outcomes is worthwhile. Chapter 8 of the original guideline document links suggestions for audit to guideline recommendations. Audit datasets are available at www.brit-thoracic.org.uk.

IMPLEMENTATION TOOLS

Audit Criteria/Indicators
Chart Documentation/Checklists/Forms
Clinical Algorithm
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN), British Thoracic Society. British guideline on the management of asthma. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2009 Jun. 125 p. (SIGN publication; no. 101). [833 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

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British Thoracic Society - Medical Specialty Society
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GUIDELINE COMMITTEE

Not stated

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All members of the guideline development group made declarations of interest and further details of these are available on request from the Scottish Intercollegiate Guidelines Network (SIGN) Executive.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Scottish Intercollegiate Guidelines Network (SIGN), British Thoracic Society. British guideline on the management of asthma. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2008 May. 121 p. (SIGN publication; no. 101). [766 references]

This guideline will be considered for review in three years. Any amendments to the guideline in the interim period will be noted on the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Quick reference guide: British guideline on the management of asthma. Scottish Intercollegiate Guidelines Network, 2009 Jun. 21 pages. Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.
- Evidence tables. Available from the SIGN Web site
- SIGN 50: a guideline developers' handbook. Edinburgh (UK): Scottish Intercollegiate Guidelines Network. (SIGN publication; no. 50). Available from the SIGN Web site.
- Appraising the quality of clinical guidelines. The SIGN guide to the AGREE (Appraisal of Guidelines Research and Evaluation) guideline appraisal instrument. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001. Available from the SIGN Web site.
- Key points for audit (Section 8.3) and a recommended asthma action plan (Annex 11) can be found in theÂ original guideline document.

PATIENT RESOURCES

None available

NGC STATUS

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